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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,972	01/17/2002	Robert Selfridge	T7029CIPPCT.US	9911
20551 7590 09/20/2007 THORPE NORTH & WESTERN, LLP. 8180 SOUTH 700 EAST, SUITE 350 SANDY, UT 84070			EXAMINER LEE, PING	
			ART UNIT 2615	PAPER NUMBER
			MAIL DATE 09/20/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 09/787,972	Applicant(s) SELFRIDGE ET AL.	
	Examiner Ping Lee	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8, 11, 12, 16-22, 24-31, 34, 35, 39, 40, 43-51, 79, 82, 83, 85, 86 and 91-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 1-4,7,8,11,12,16-22,24-31,34,35,39,40,43-51,79,82,83,85,86 and 91-93.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 80 and 81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 80 and 81 are vague and indefinite because they depend on cancelled claim.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 3, 19, 21, 24, 26-30, 79, 85, 86, 91 and 92 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al (US 4,823,908).

Regarding claims 1 and 3, Tanaka et al (hereafter Tanaka) disclose a method for generating parametric audio output based on interaction of multiple ultrasonic frequencies within air as a nonlinear medium, said method comprising the steps of:

a) generating (by 6 as shown in Fig. 2) an electronic signal comprising at least two ultrasonic signals having a difference in value which falls within an audio frequency range (col. 2, lines 34-43);

b) transferring the electronic signal to an electro acoustical polymer film transducer diaphragm (8) (col. 7, line 3; by definition, piezoelectric material is a polymer; also film implies a very thin sheet, Tanaka's disclosure on col. 7, line 4 implies that the vibrator is very thin, so it could be read as film transducer) which couples directly with the air as part of a single stage energy conversion process (see Fig. 2);

c) converting the electronic signal at the diaphragm directly to mechanical displacement as a driver member of a parametric speaker (col. 4, line 29 and 44-45);
and

d) mechanically emitting the at least two ultrasonic signals from the diaphragm into the air as ultrasonic compression waves which interact within the air to generate the parametric audio output (col. 2, lines 39-42).

Regarding claims 19 and 21, Tanaka further shows the supporting structure (as shown in Fig. 5 to support element 8).

Regarding claims 24 and 26-29, as shown in Fig. 22, the diaphragm is formed by an array of arcuate emitter sections (each ultrasonic wave radiator 30 will be curved with the applied voltage).

Regarding claim 30, Tanaka shows in Fig. 23 the elongate, channel-shaped indentation.

Regarding claims 79, 85, 86, 91 and 92, Tanaka shows in Fig. 23 the support plate (32) and a thin piezoelectric film (form on 30) having ultrasonic emitter array (as shown in Fig. 27).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 2, 4, 11, 12, 20, 22, 34, 35, 46, 48, 49 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Schindel et al (hereafter Schindel) (US 5,287,331).

Regarding claims 2 and 20, Tanaka fails to explicitly show an electrostatic transducer. Tanaka teaches an ultrasonic generator using a piezoelectric vibrator without specifying the particular structure. One skilled in the art would have expected that any specify design of the ultrasonic transducer could be used without generating any unexpected result.

Schindel teaches how to use a piezoelectric film (col. 3, lines 67-68) electrostatic transducer with a backplate (1) for generating ultrasonic signals. Thus, it would have been obvious to one of ordinary skill in the art to modify Tanaka in view of Schindel by using the piezoelectric film electrostatic transducer in order to generate the ultrasonic signals.

Regarding claims 4 and 22, Schindel teaches the thermal formed electro mechanical film diaphragm (col. 4, line 1).

Regarding claims 11, 12, 34 and 35, Schindel fails to show the dimension of the diaphragm is related to the wavelength of the lowest ultrasonic frequency. It was well known in the art that the frequency of a signal is inversely related to its wavelength. Therefore, it would have been obvious to one of ordinary skill in the art to select a

diaphragm dimension greater than the lowest ultrasonic frequency or ten times greater than the lowest ultrasonic frequency to ensure that the lowest ultrasonic frequency would be produced properly.

Regarding claims 46-49 and 51, Schindel teaches the aligned cavities.

Regarding claim 93, although Schindel and Tanaka respectively fail to show diaphragm used PVDF. PVDF was a well known material for making piezoelectric film. Thus, it would have been obvious to one of ordinary skill in the art to modify Tanaka and Schindel by using well known film material, such as PVDF, to generate the ultrasonic sound.

7. Claims 4, 7, 8, 16, 17, 25, 31, 39, 40, 46, 48, 49, 51 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Tibbetts et al (hereafter Tibbetts) (US 4,056,742).

Regarding claims 4, 7, 8, 31, 46, 48, 49 and 51, Tanaka fails to show thermally formed film diaphragm transducer. Tanaka teaches an ultrasonic generator using a piezoelectric vibrator without specifying the particular structure. One skilled in the art would have expected that any specify design of the ultrasonic transducer could be used without generating any unexpected result. Tibbetts teaches how to use a piezoelectric film (col. 3, lines 67-68) transducer with a backplate (1) for generating ultrasonic signals. As shown in the drawings, Tibbetts suggested the curvature for both the film and the backplate. Although Tibbetts fails to show that the film is thermally formed, it was well known in the art to use heat to alter the shape of the film. Thus, it would have been obvious to one of ordinary skill in the art to modify Tanaka in view of Tibbetts by using

the piezoelectric film transducer as taught in Tibbetts in order to generate the ultrasonic signals.

Regarding claims 25 and 43-45, Tibbetts teaches that the particular layout is used to reduce the distortion (see abstract). Tanaka teaches that the sound pressure level is less than 140 dB (col. 7, lines 3-5).

Regarding claims 16, 17, 39 and 40, although Tibbetts fails to explicitly show the distance between the film and the supporting plate is one-quarter wavelength, this is an inherent feature to ensure that the piezo film to operate properly.

Response to Arguments

8. Applicant's arguments filed 6/27/07 have been fully considered but they are not persuasive.

On p. 12, applicant argued that Tanaka fails to show that the transducer is a polymer film transducer.

Examiner disagrees. Tanaka discloses "piezoelectric vibrator" on col. 7, line 3. The term piezoelectric implies that the material is a polymer. Whether the claimed invention does not include ceramic transducers is irrelevant. As shown in Fig. 2, Tanaka clearly shows that how the vibrator (8) to convert an electronic signal (from 7) to mechanical displacement (to generate waves by the vibration of 8). The acoustic filter (10) in Tanaka is not being interpreted as the claimed electro acoustic polymer film transducer diaphragm. Applicant's argument was directed to filter. However, the rejection as indicated above is the piezoelectric vibrator.³

On p. 14, applicant's argument is based on the assumption that Tanaka discloses a ceramic bimorph transducer.

This is not persuasive. Applicant pointed several dimensions and frequency response of the transducer used in Tanaka and stated that Tanaka uses an array of bimorph transducers. Tanaka never uses the word "bimorph" in the entire patent. Applicant also argued that the polymer film transducers are different from ceramic transducers. As indicated above, "polymer film transducers" read on the piezoelectric vibrators as disclosed in Tanaka. Tanaka never specifies the exact material being disclosed, so it would be improper to assume that Tanaka discloses ceramic transducer. Furthermore, the phrase "polymer film transducer" is very broad. Even a ceramic transducer (examiner does not admit that Tanaka discloses a ceramic transducer) could be read as polymer film transducer because there is piezoelectric ceramic transducer. A film, by definition, is a very thin sheet.

On p. 14, applicant uses another patent, US 4,246,448, issued to Tam to argue that the maximum sound pressure level produced by electrostatic transducer is lower than the sound pressure level of the transducer produced as disclosed in Tanaka.

First of all, Schindel's structure is different from Tam's, so one skilled in the art would not and could not assume that Schindel's response would be the same as the one disclosed in Tam. Secondly, the office action does not indicate that Tanaka uses bimorph ceramic transducer. It is irrelevant to the claims that there is a difference between the polymer film transducer and the bimorph ceramic transducers. Applicant's argument is based on what is being disclosed in the specification, not the claims alone.

On p. 16, applicant argued that it was not obvious to replace a plurality of high power bimorph transducer with a polymer film transducer having less power.

This is not persuasive. Tanaka does not use the word bimorph in the entire patent. None of the claims state how much power is being used to generate the audio signal, therefore, this feature is irrelevant.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

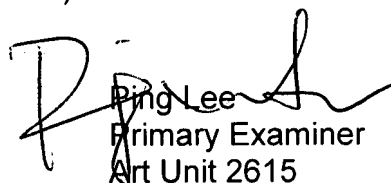
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ping Lee whose telephone number is 571-272-7522.

The examiner can normally be reached on Monday, Wednesday and Friday.

Art Unit: 2615

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian C. Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Ping Lee
Primary Examiner
Art Unit 2615

pwl